



Clinical Case Report Competition

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Second Place Winner

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The effects of massage therapy techniques on restoring pain free range of motion of the shoulder affected by an undiagnosed shoulder impingement syndrome

Abstract

The purpose of this case report was to determine whether 10 visits to a massage therapist for 90 minutes each over a six-week period can help to restore pain free range of motion of the shoulder, and the ability to perform daily activities, such as lifting, dressing and brushing hair, in a patient affected by an undiagnosed shoulder impingement syndrome.

The assessment tools employed were history intake, postural assessment, and the assessment of the range of motion with using of a goniometer, as well as several special test maneuvers. The treatment techniques included myofascial release, Swedish massage, joint mobilizations and cross fibre frictions combined with home care recommendations, such as stretching, strengthening, hydrotherapy and patient education.

The results had shown a significant decrease in pain with active range of motion of the shoulder. The results suggest that the massage therapy techniques employed appear to be effective in restoring pain free range of motion of the shoulder in a single patient affected by an undiagnosed shoulder impingement syndrome.

However, future research is needed, namely larger studies on multiple patients, in order to have a better understanding of the effectiveness of massage therapy in treatment of the shoulder impingement.

KEYWORDS: Shoulder Impingement Syndrome, Massage Therapy, Joint Mobilizations, Cross Fiber Frictions

Introduction

Shoulder impingement syndrome (SIS) is one of the most common pathologies affecting the shoulder complex (Bang, Deyle, 2000). SIS primarily affects the structures under the subacromial arch, such as subacromial bursa, rotator cuff tendons and sometimes the long head of the biceps brachii muscle (Hertling, Kessler, 2006). The main factor contributing to the development of SIS is the narrowing of the suprahumeral space beneath the subacromial arch. It may be due to several reasons, including vascular compromise of the rotator cuff tendons, variations in the structure of the acromion process, overuse injuries, faulty posture and biomechanics, or acromioclavicular joint degeneration (Kisner, Colby, 2007). The patient affected by SIS usually presents with sharp pain over the anterolateral brachial region that might refer to the anterior arm down to the elbow. The pain is aggravated by active movements, such as reaching above or behind the shoulder. The onset of pain is usually gradual with no history of trauma. The other findings that usually appear with SIS are weakness of the rotator cuff muscles, mainly supraspinatus, shoulder girdle asymmetry, antalgic dressing patterns and using of the limb during gait. The range of motion (ROM), however, is usually relatively full (Hertling, Kessler, 2006).

The traditional medical management of the SIS includes conservative approach, such as rest, ice and physical therapy, as well as more invasive interventions, such as corticosteroid injections and surgical procedures, including arthroscopic

acromioplasty (Fongemie, Buss, Rolnick, 1998). A systematic review had shown that there was no significant difference in effects of surgery versus conservative approach; moreover, conservative approach has a lower risk of complications (Gebremariam, Hay, Koes, Huisstede, 2011). However, if the patient hasn't had an improvement after 6 month of receiving other interventions, the surgery might still be considered (Fongemie, Buss, Rolnick, 1998). Although the corticosteroid injections have been effective in treating a number of inflammatory orthopedic conditions, the long term use of such interventions may have a number of negative effects on connective tissues including a delay of the healing process (Fadale, Wiggins, 1994). Considering these facts, the conservative approach seems to be a safer way for treating the SIS.

There are a number of research studies on treating SIS performed by physiotherapists that employ manual therapy techniques similar to those, which are employed by massage therapists. In a brief clinical trial, 52 participants affected by SIS were randomly assigned in two groups, which included a group performing stretching and strengthening exercises only and group performing the same exercises combined with manual physical therapy interventions six times over a three-week period. The results had shown a greater improvement in the manual therapy group than the exercise group for both pain and weakness (Bang, Deyle, 2000). In another double-blind randomized controlled pilot study 33 participants affected by SIS were assigned into four groups, which included

supervised exercise only; supervised exercise with glenohumeral mobilizations; supervised exercise with a mobilization-with-movement technique; and a physician advice only. The results of that study had shown that performing exercises combined with glenohumeral mobilizations or mobilization-with-movement techniques had more significant effects on decreasing pain and improving overall function (Kachingwe, Phillips, Sletten, Plunkett, 2008). In respect of these findings, a manual therapy approach combined with an exercise program seems to be an effective way for treating the SIS.

The goal of this case report was mainly to increase the research database related to massage therapy, particularly in regards to treatment of the SIS. The study was designed to determine whether 10 visits to a massage therapist for 90 minutes each over a six-week period can help to restore pain free range of motion and ability to perform daily activities, such as lifting, dressing and brushing hair, in a patient affected by an undiagnosed SIS. The treatments were performed using general massage techniques, such as myofascial release (MFR) and Swedish massage, as well as specific techniques, such as joint mobilizations and cross fibre frictions on the affected side. Home care recommendations were given in addition to the treatment, such as stretching and strengthening exercises, hydrotherapy and patient education.

Case Report Participant

This study was performed on a 41 year old female, who was right hand dominant. Prior to the study she was a fulltime student in an RMT (Registered Massage Therapist) program. Her previous occupation was working as a day care manager, which included mostly office duties. She did not exercise on the regular bases. The case participant did not have any underlying systemic pathologies prior to beginning of the treatment. Previous health history did not include any serious illnesses or surgeries, except disc herniation at the L4-L5 level fifteen years ago, which was successfully treated by a cortisol injection.

The primary complaint was the pain in the anterior left shoulder mainly around bicipital groove, coracoid process and sometimes behind the acromion process. The pain was deep, aching and sometimes shooting over the anterior arm down to the elbow. It had been getting worse with activities, such as lifting, brushing hair, dressing and other overhead motions. It had been getting better with rest, ice, stretching and relaxation massage. It woke her up at night, if she slept on the left side. It had started as an acute episode and gradually progressed to a chronic condition. The participant was not able to remember exactly what precipitated the acute symptoms. The complaint had been present for a period of two years. It had not been assessed or diagnosed by a physician or any other health care practitioner.

At the beginning of the study the participant presented with a head forward posture, elevated and rounded shoulders. The left shoulder was noticeably higher. The participant was guarding the affected side, namely avoiding flexion and abduction by using scapulothoracic motion instead. The muscles around the shoulders were hypertoned, particularly upper trapezius, levator scapulae, deltoideii, infraspinatus, teres minor, supraspinatus, pectoralis major, biceps brachii, as well as the rhomboid muscles. Prior to the first treatment the participant presented with full ROM of the left shoulder, however, the pain, which equaled 8 on 1-10 pain scale, was present in active abduction after 100 degrees and active flexion after 93 degrees. The participant was positive for Neer Impingement and Hawkins-Kennedy tests with pain. She was also positive for the Speed's test with moderate pain and slight weakness, however, the manual muscle test for the biceps brachii resulted in a grade of normal. And, finally, the Empty Can test also resulted as positive with significant pain and weakness. The participant signed the consent form and agreed to avoid any other therapeutic interventions until the end of the treatment.

Methods

The assessment methods used were history intake, postural assessment, and assessment of the ROM of the glenohumeral joint with using of goniometer to measure the point, where the pain starts during the active motions. Several special test maneuvers were employed, such as Neer Impingement, Hawkins-Kennedy,

Empty Can and Speed's tests to confirm the presence of the SIS. All the measurements were performed by the same therapist. The assessments were performed 4 times, once prior to the first treatment and then after the third, the seventh and the tenth treatments.

The pain was evaluated using 1-10 pain scale, where 1 was no pain at all and 10 was excruciating, non-tolerable pain that required termination of activity.

The primary treatment goals were to restore pain free ROM of the left glenohumeral joint in flexion past 93 degrees and abduction past 100 degrees. The secondary goals were to address the structures and symptoms that contributed to the main complaint, namely to increase the space between the subacromial arch and the head of the humerus; to increase the strength of the supraspinatus muscle; and, finally, to address postural imbalances and muscle hypertonicity.

The treatments were performed by the same therapist that had to follow the same treatment protocol with slight changes according to participant's responses to different techniques. The treatment was broken down into three sections: 35 minutes were spent on the back and shoulders in prone position, 20 minutes were spent on the unaffected side and 35 on the affected in supine position. The following techniques were performed bilaterally unless otherwise noted. The home care exercises were performed daily until the last treatment.

The treatment protocol in prone position was as follows:

- Cross hands fascial release technique on thoracolumbar fascia and fascia of the upper back and shoulders to stretch out and warm up the superficial fascia prior to working with deeper structures.
- Direct MFR techniques, such as picking up the muscle, moving it in 4 planes and holding in the most restricted direction on upper trapezius, levator scapulae and rhomboids to address the head forward posture.
- Neuromuscular Therapy (NMT), particularly muscle separation, on rhomboids, supraspinatus, infraspinatus and teres minor muscles to decrease hypertonicity.
- General Swedish techniques, such as effleurage, wringing, open c, knuckle, fingertip, palmer kneading, and muscle squeezing to increase general circulation; deep thumb kneading on supraspinatus towards the insertion in order to bring circulation to the tendon.

The treatment protocol in supine position was as follows:

- Pectoralis major costal and clavicular attachments release using ulnar border of the hand followed by a passive stretch for 30 seconds in order to open up the anterior chest and address the rounded shoulder posture.
- Coracoacromial and costoclavicular ligaments release to increase the space under the subacromial arch.
- Fascial release over the shoulder arm and forearm by stretching the fascia in order to warm up the superficial structures prior to the deeper work.

- Biceps Brachii “pin and stretch” release to decrease hypertonicity.
- General Swedish techniques to increase circulation to the shoulder.
- Deep thumb kneading on deltoideii muscles to decrease hypertonicity.
- Cross fibre frictions with ice massage on the supraspinatus and biceps tendons of the left shoulder to decrease adhesions and promote natural healing process. The frictions were applied with light, moderate and deep pressure, two minutes each with ice massage for one minute in between, prior and after the frictions. The frictions on the supraspinatus tendon were discontinued after the second treatment due to participant’s intolerance.
- Joint mobilizations of the left glenohumeral joint, particularly inferior mobilizations to increase abduction, posterior mobilizations to increase flexion and general distraction to increase joint nutrition. The mobilizations started from Grades I-II during the first three treatments and progressed to Grades III-IV during the last seven treatments.

The home care instructions were given as follows:

- Pectoralis major, biceps brachii, upper trapezius, levator scapulae stretches. They were performed in following protocol: 3 repetitions for 30 seconds, 3 times a day.
- Active ROM of the affected shoulder with no guarding for the first two weeks, which progressed to supraspinatus concentric and eccentric strengthening exercises using shoulder abduction from 0 to 90 degrees

performed as follows: 3 sets of 10 repetitions, 3 times a day, for the duration of last 4 weeks.

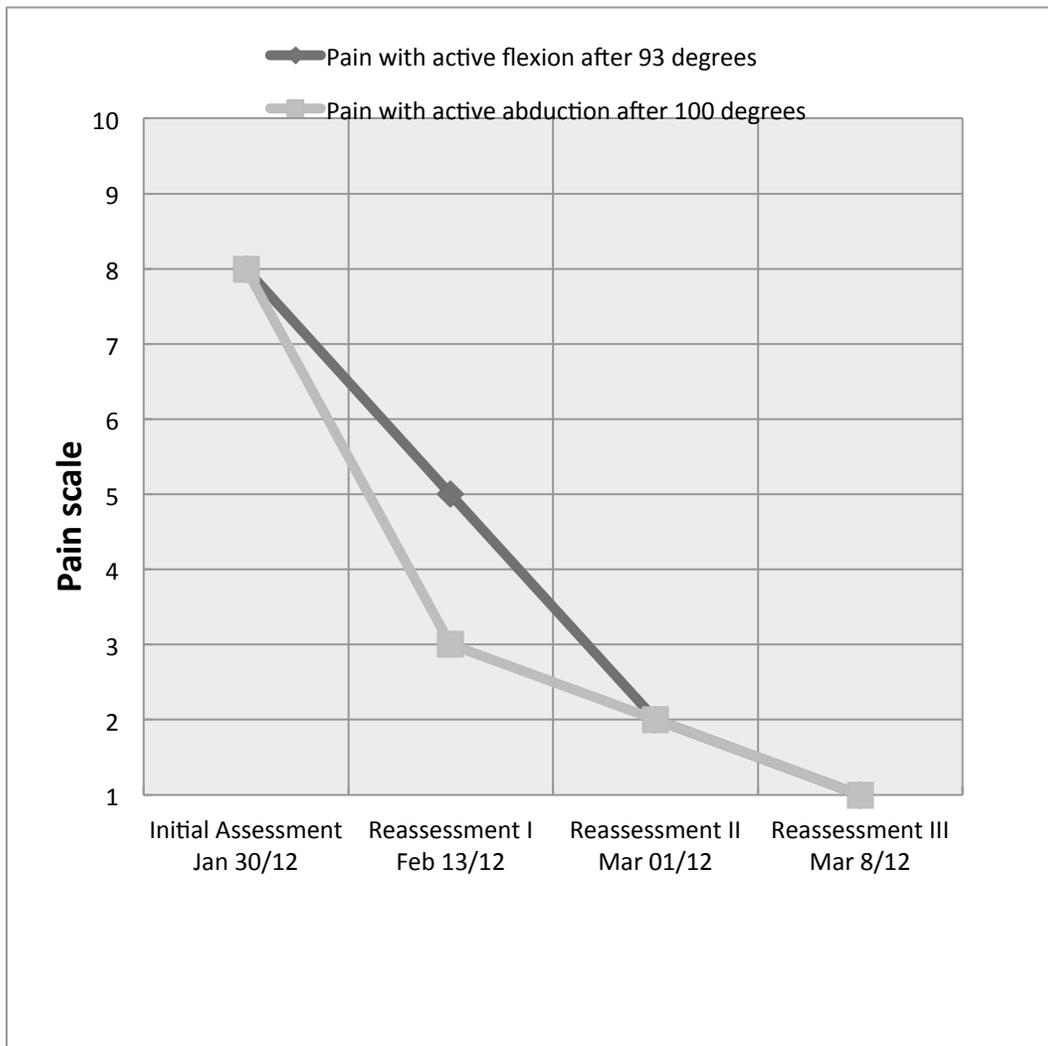
- Heat on the upper back and shoulders for 20 minutes every day before going to sleep.
- Cold pack over the bicipital groove for 10 minutes following each treatment to avoid inflammation that could have been caused by frictions.
- The participant was instructed to avoid activities that aggravate the symptoms, like lifting heavy objects and performing overhead motions.

Results

The results of the first reassessment had shown that the pain with flexion had decreased to 5 out of 10, while the pain with abduction had decreased to 3 out of 10. The participant was still positive for the Empty Can test with moderate pain and weakness. Lastly, the left shoulder appeared to be slightly elevated.

The second reassessment had indicated that the pain with flexion had decreased to 2 out of 10 and the pain with abduction had also decreased to 2 out of 10. The participant was still positive for the Empty Can test with slight pain and moderate weakness. The Speed's test also appeared positive with no pain but slight weakness. The Neer Impingement and the Hawkins-Kennedy tests resulted as negative and, finally, the shoulders appeared to be symmetrical.

After the final treatment the pain with both flexion and abduction had decreased to 1 out of 10. The participant was negative for Neer Impingement and Hawkins-Kennedy tests, the shoulder girdle appeared to be symmetrical. However, the participant was still positive for the Empty Can test with moderate weakness and the Speed's test with slight weakness, there was no pain during performing both of the tests.



Discussion

According to the results it appeared that the participant had a significant decrease in pain with both active flexion and abduction of the glenohumeral joint. This indicates that the primary goal of the treatment had been met and the ability to perform daily activities in pain free manner had been restored. The joint mobilizations combined with cross fibre frictions, general massage techniques and home care recommendations appeared to be effective in restoring pain free ROM in patient affected by an undiagnosed SIS. Therefore, these findings correspond to the previous research studies conducted by physiotherapists.

The other positive outcome was that the shoulder girdle appeared to be symmetrical according to the last two reassessments comparing to the baseline measurements, where the left shoulder appeared to be moderately elevated. The Neer Impingement and Hawkins-Kennedy tests resulted as negative, which suggests that the space between the subacromial arch and the head of the humerus had been increased. These findings suggest that the techniques employed in this study were effective in increasing of the subacromial space and decreasing the shoulder girdle asymmetry. However, the final reassessment had shown that there was no significant improvement in the muscle strength of the supraspinatus. This possibly indicates that the techniques used were not appropriate or not sufficient. The strengthening exercises could have been incorporated into the treatment, which in conjunction with home care exercises could have been more effective.

The most important fact is that it becomes evident from reviewing of the participant's diary that the participant did not have a clear understanding on how to perform the strengthening exercises. For that reason, it is highly important to emphasize the significance of clear instructions for the home care and making sure that the patient understands and performs it correctly.

Although this study had relatively positive results, it was performed by an RMT student, who was treating a single patient. It is highly possible that the greater results could have been achieved, if the similar treatment was performed by an experienced RMT. It would also have had a more significant contribution to a massage therapy research, if the similar treatment was performed on multiple patients. For instance, if a randomised clinical trial was conducted, it would have been clearer for RMT's and other health care practitioners, whether the massage therapy is effective for treating the SIS.

Therefore, the future research is highly needed in order to increase the research database related to massage therapy and to promote the RMT profession.

In summary, the massage therapy techniques, such as joint mobilizations, cross fibre frictions, MFR and Swedish massage in conjunction with home care recommendations appeared to be effective in restoring pain free ROM of the shoulder in a single patient affected by an undiagnosed SIS. Nevertheless, future research is needed, namely wider studies on multiple patients designed and

performed by experienced RMT's, in order to have a better understanding of the effectiveness of massage therapy in treatment of the SIS.

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